PART 6.
SURFACE WATER TREATMENT

Subpart A - Introduction and General Requirements

WAC 246-290-601 Purpose of surface water treatment. (1) Part 6 of chapter 246-290 WAC establishes filtration and disinfection as treatment technique requirements for water systems using surface or GWI sources. The Part 6 treatment technique requirements are established in lieu of maximum contaminant levels (MCLs) for the following contaminants:

(a) *Giardia lamblia*;
(b) Viruses;
(c) Heterotrophic plate count bacteria;
(d) *Legionella*; ((~~and~~))
(e)(*Cryptosporidium* (for systems serving at least 10,000 people); and)

(((~~e~~))) ((f))Turbidity.

(2) For water systems using unfiltered surface sources, in whole or part, and that have been required to install, but have yet to complete the installation and operation of, filtration facilities, the turbidity levels at entry points to distribution and sampling/analytical requirements shall be in accordance with 40 CFR 141.13 and 40 CFR 141.22, respectively.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-601, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-601, filed 3/25/93, effective 4/25/93.]

WAC 246-290-620 Applicability of surface water treatment requirements. (1) The requirements of Part 6 of this chapter apply to water systems that:

(a) Use surface sources or ground water sources under the direct influence of surface water (GWI); or

(b) Purchase surface or GWI water from an approved public water system or other entity acceptable to the department.

(2) The requirements of Part 6 of this chapter do not apply to water systems that use unfiltered surface or GWI sources as emergency sources, provided the source is physically disconnected from the system at all times until it is needed, and the purveyor meets the following conditions:

(a) Has a department-approved emergency response plan; and

(b) Provides disinfection treatment that meets the requirements under WAC 246-290-662 (2) (d).

(3) The requirements of WAC 246-290-640 apply to **Group A** systems that use sources potentially under the influence of surface water as determined by the department.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-620, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-620, filed 3/25/93, effective 4/25/93.]

WAC 246-290-630 General requirements. (1) The purveyor shall ensure that treatment is provided for surface and GWI sources consistent with the treatment technique requirements specified in Part 6 of chapter 246-290 WAC.

(2) The purveyor shall install and properly operate water treatment processes to ensure at least:

(a) 99.9 percent (3 log) removal and/or inactivation of *Giardia lamblia* cysts; ((~~and~~))

(b) 99.99 percent (4 log) removal and/or inactivation of viruses((~~.~~)) (; and

(b) 99 percent (2 log) removal of *Cryptosporidium* oocysts if serving at least 10,000 people and required to filter.)

(3) The purveyor shall ensure that the requirements of subsection (2) of this section are met between a point where the source water is not subject to contamination by untreated surface water and a point at or before the first consumer.

(4) The department may require higher levels of removal and/or inactivation of *Giardia lamblia* cysts (, *Cryptosporidium* oocysts,) and viruses than specified in subsection (2) of this section if deemed necessary to protect the health of consumers served by the system.

(5) The purveyor shall ensure that personnel operating a system subject to Part 6 of chapter 246-290 WAC meet the requirements under chapter 70.119 RCW and chapter 246-292 WAC.

(6) The purveyor of a **Group A community** system serving water from a surface or GWI source to the public before January 1, 1991, shall comply with applicable minimum treatment requirements. The purveyor shall meet either:

(a) The filtration and disinfection requirements under WAC 246-290-660 and 246-290-662 respectively;

(b) The criteria to remain unfiltered under WAC 246-290-690 and the disinfection requirements under WAC 246-290-692; or

(c) The criteria to provide a limited alternative to filtration under WAC 246-290-691 and the disinfection requirements under WAC 246-290-692.

(7) The purveyor of a **Group A noncommunity** system serving water from a surface or GWI source, shall meet either:

(a) The filtration and disinfection requirements under WAC 246-290-660 and 246-290-662, respectively; or

(b) The criteria to provide a limited alternative to filtration under WAC 246-290-691 and the disinfection requirements under WAC 246-290-692.

(8) The purveyor of a **Group A** system first serving water from a surface or GWI source to the public after December 31, 1990, shall meet either:

(a) The filtration and disinfection requirements under WAC 246-290-660 and 246-290-662, respectively; or

(b) The criteria to provide a limited alternative to filtration under WAC 246-290-691 and the disinfection requirements under WAC 246-290-692.

(9) The purveyor of a system required to install filtration may choose to provide a limited alternative to filtration or abandon the surface or GWI source as a permanent or seasonal source and develop an alternate, department-approved source. Purveyors that develop alternate ground water sources or purchase water from a department-approved public water system using a ground water source shall no longer be subject to Part 6 of chapter 246-290 WAC, once the alternate source is approved by the department and is on line.

(10) A purveyor that chooses to provide a limited alternative to filtration shall submit an application to the department that contains the information necessary to determine whether the source can meet the criteria.

(11) If a limited alternative to filtration is provided, then the purveyor shall install and properly operate treatment processes to ensure greater removal and/or inactivation efficiencies of *Giardia lamblia* cysts, viruses, or other pathogenic organisms of public health concern ((including *Cryptosporidium* oocysts)) than would be achieved by the combination of filtration and chlorine disinfection.

((12) Systems that were required to develop a disinfection profile under 40 CFR 141.172 shall provide that profile and a calculated disinfection benchmark, as described in 40 CFR 141.172(c)(2) and (3), along with other project information specified in WAC 246-290-110, when proposing any change to the disinfection treatment system. The proposed change shall include an analysis of how the proposed change will affect the current level of disinfection. The profile must also be available for inspection during routine sanitary surveys conducted pursuant to WAC 246-290-416.)

[Statutory Authority: RCW 43.20.050. 99-07-021 and 99-10-076, § 246-290-630, filed 3/9/99 and 5/4/99, effective 4/9/99 and 6/4/99; 93-08-011 (Order 352B), § 246-290-630, filed 3/25/93, effective 4/25/93.]

WAC 246-290-632 Treatment technique violations. (1) A treatment technique violation shall be considered a violation of a primary drinking water standard and in the case of an unfiltered system, may result in the purveyor of an unfiltered system being required to install filtration.

(2) A treatment technique violation occurs when a system using a surface or GWI source is identified by the department as the source of a waterborne disease outbreak or any of the following occur as applicable:

(a) The purveyor providing filtration delivers unfiltered water or fails to meet one or more of the following requirements:

(i) Filtration treatment in accordance with WAC 246-290-660; or

(ii) Disinfection treatment in accordance with WAC 246-290-662.

(b) The purveyor required to install filtration:

(i) Fails to meet the interim disinfection requirements in accordance with WAC 246-290-672 or as otherwise directed by the department; or

(ii) Fails to install filtration or develop an alternate source by the applicable time lines specified in WAC 246-290-670.

(c) The purveyor of an unfiltered surface water, or GWI source, meeting the criteria to remain unfiltered:

(i) Delivers water with a turbidity level exceeding 5.0 NTU measured at a point immediately prior to the point of primary disinfection; or

(ii) Fails to meet one or more of the disinfection requirements in accordance with WAC 246-290-692 after the dates specified in WAC 246-290-686.

(d) The purveyor of an unfiltered source meeting the criteria to provide a limited alternative to filtration:

(i) Delivers water with a turbidity level exceeding 5.0 NTU measured at a point immediately prior to the point of primary disinfection; or

(ii) Fails to meet one or more of the disinfection requirements in accordance with WAC 246-290-692.

(e) A purveyor supplies water from an unfiltered source that has not been previously approved by the department.

(f) A purveyor of a department approved unfiltered source that fails to meet the on-going criteria to remain unfiltered:

(i) Delivers water with a turbidity level exceeding 5.0 NTU measured at a point immediately prior to the point of primary disinfection; or

(ii) Fails to meet one or more of the disinfection requirements in accordance with WAC 246-290-692.

(g) A purveyor of a department approved unfiltered source that has failed to meet the criteria to provide a limited alternative to filtration:

(i) Delivers water with a turbidity level exceeding 5.0 NTU measured at a point immediately prior to the point of primary disinfection; or

(ii) Fails to meet one or more of the disinfection requirements in accordance with WAC 246-290-692.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-632, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 94-14-001, § 246-290-632, filed 6/22/94, effective 7/23/94; 93-08-011 (Order 352B), § 246-290-632, filed 3/25/93, effective 4/25/93.]

WAC 246-290-634 Follow-up to treatment technique violations. When a treatment technique violation occurs, the purveyor:

(1) Shall report to the department in accordance with:

(a) WAC 246-290-666 for purveyors providing filtration or required to filter;

(b) WAC 246-290-674 for purveyors installing filtration; or

(c) WAC 246-290-696 for purveyors meeting the criteria to remain unfiltered or providing a limited alternative to filtration;

(2) Shall notify the public in accordance with ((~~WAC 246-290-495~~)) (Part 7, Subpart A of this chapter);

(3) Shall determine the cause of the violation;

(4) Shall take action as directed by the department; and

(5) May be subject to enforcement under WAC 246-290-050.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-634, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-634, filed 3/25/93, effective 4/25/93.]

WAC 246-290-636 Determination of disinfectant contact time (T). (1) The purveyor shall calculate T at peak hourly flow for each surface or GWI source.

(2) For pipelines, the purveyor shall calculate T by dividing the internal volume of the pipe by the peak hourly flow rate through that pipe.

(3) For all other system components used for inactivation of *Giardia lamblia* cysts, viruses, and other microorganisms of public health concern, the purveyor shall use tracer studies or empirical methods to determine T.

(4) The purveyor shall use the T10 value determined by tracer studies or other methods acceptable to the department as T in all CT calculations.

(5) Tracer studies.

(a) The purveyor shall conduct field tracer studies on all system components with configurations (geometry and/or baffling) for which analogous contact times are not documented.

(b) Before conducting tracer studies, the purveyor shall obtain the department's approval of a tracer study plan. The plan shall identify at a minimum:

(i) How the purveyor will conduct the study;

(ii) The tracer material to be used;

(iii) Flow rates to be used; and

(iv) The names, titles, and qualifications of the persons conducting the study.

(c) A professional engineer registered in the state of Washington shall direct the conduct of all tracer studies.

(d) Tracer studies shall be conducted in accordance with good engineering practices using methods acceptable to the department such as those described in department guidance on surface water treatment.

(e) The department may require the purveyor to conduct additional tracer studies when:

(i) Modifications impacting flow distribution or T are made; or

(ii) Increases in flow exceed the conditions of the previous tracer studies.

(6) Empirical methods.

(a) Empirical methods may be used to calculate T10, if the purveyor demonstrates to the department's satisfaction that system components have configurations analogous to components on which tracer studies have been conducted and results have been documented.

(b) The purveyor shall submit to the department for review and approval engineering justification for determining T10 using empirical methods. As-built drawings of system components in their current configurations shall be submitted with the engineering justification.

(c) A professional engineer registered in the state of Washington shall prepare the engineering justification for determining T10 using empirical methods.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-636, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-636, filed 3/25/93, effective 4/25/93.]

WAC 246-290-638 Analytical requirements. (1) The purveyor shall ensure that only qualified persons conduct measurements for pH, temperature, turbidity, and residual disinfectant concentrations. In this section, qualified shall mean:

(a) A person certified under chapter 246-292 WAC;

(b) An analyst, with experience conducting these measurements, from the state public health laboratory or another laboratory certified by the department; or

(c) A state or local health agency professional experienced in conducting these measurements.

(2) The purveyor shall ensure that measurements for temperature, turbidity, pH, and residual disinfectant concentration are made in accordance with "standard methods((.))" (, or other EPA approved methods.)

(3) The purveyor shall ensure that samples for coliform and HPC analysis are:

(a) Collected and transported in accordance with department-approved methods; and

(b) Submitted to the state public health laboratory or another laboratory certified by the department to conduct such analyses.

(4) Turbidity monitoring.

(a) The purveyor shall equip the system's water treatment facility laboratory with a:

(i) Bench model turbidimeter; and

(ii) Continuous turbidimeter and recorder if required under WAC 246-290-664 or 246-290-694.

(b) The purveyor shall ensure that bench model and continuous turbidimeters are:

(i) Designed to meet the criteria in "standard methods" (,EPA Method 180.1, or Great Lakes Instruments Method 2); and

(ii) Properly operated, calibrated, and maintained at all times in accordance with the manufacturer's recommendations.

(c) The purveyor shall validate continuous turbidity measurements for accuracy as follows:

(i) Calibrate turbidity equipment based upon a primary standard in the expected range of measurements; and

(ii) Verify continuous turbidimeter performance on a weekly basis, not on consecutive days, with grab sample measurements made using a properly calibrated bench model turbidimeter.

(d) When continuous turbidity monitoring equipment fails, the purveyor shall measure turbidity on grab samples collected at least every four hours (from the combined filter effluent and individual filters) while the system serves water to the public and the equipment is being repaired or replaced. The purveyor shall have continuous monitoring equipment on-line within five working days of failure.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-638, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-638, filed 3/25/93, effective 4/25/93.]

WAC 246-290-639 SWTR records. (1) Purveyors using surface or GWI sources shall maintain accurate and complete operations records.

(2) Operations records shall include, but not be limited to, the following as applicable:

(a) Results of all monitoring conducted under Part 6 of chapter 246-290 WAC;

(b) Quantity of water produced, plant flow rates, and hours of operation;

(c) Types and quantities of chemicals used;

(d) Dates and information pertaining to filter and/or disinfection system maintenance;

(e) Dates and results of filter and/or disinfection system inspections including records of filtration and backwash rates; and

(f) Dates and descriptions of major equipment and/or treatment process failures and corrective actions taken.

(3) Operations records not reported to the department under WAC 246-290-666 or 246-290-696 shall be maintained at the purveyor's treatment facility.

[Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-639, filed 3/25/93, effective 4/25/93.]

WAC 246-290-640 Determination of GWI sources. (1) Until the department has made a source GWI determination, the purveyor shall monitor in accordance with the requirements for ground water sources in WAC 246-290-300 or as directed by the department and provide follow-up in accordance with WAC 246-290-320.

(2) The purveyor, after being notified by the department that one or more of the system sources have been classified as potential GWI, may elect to seek approval from the department to modify the potential GWI source to mitigate surface water influences prior to compliance with subsection (3) of this section, and if so, shall:

(a) Complete a project report, for departmental approval, that describes the proposed source-related modifications, including the schedule for their completion and an explanation of why the source should be reclassified upon completion of the source modifications; and

(b) Demonstrate compliance, if directed by the department, with the requirements of subsection (3) of this section upon completion of the source-related modifications.

(3) The purveyor using a source identified as a potential GWI shall provide to the department all information necessary to determine whether the source is under direct surface water influence. Information shall include, but not be limited to:

(a) Site-specific source water quality data, including temperature, conductivity, and/or other appropriate parameters as determined by the department;

(b) Documentation of source construction characteristics;

(c) Documentation of hydrogeology;

(d) Distance to surface water; and

(e) Water quality results from nearby surface water(s), including temperature, conductivity, and/or other appropriate parameters as determined by the department.

(4) Upon a determination by the department that one or more potential GWI source(s) being used are in hydraulic connection to a surface water, the purveyor shall:

(a) Secure the services of a professional engineer to direct further evaluation and actions regarding the source;

(b) Provide disinfection treatment of the source in accordance with WAC 246-290-451; and

(c) Provide microscopic particulate analyses (MPA) results for review by the department based upon a sampling plan approved by the department.

(5) A purveyor notified by the department that one or more GWI sources are in use shall:

(a) Within ninety days of notification submit a project report to the department that includes an implementation schedule for compliance with the treatment techniques specified in Part 6 of this chapter;

(b) Notify consumers served by the system; and

(c) Comply with the applicable requirements of WAC 246-290-670.

(6) After completion of the requirements in subsection (3) of this section, the purveyor may modify a GWI source to mitigate direct surface influence. In such cases, the purveyor shall:

(a) Include in a project report, for submittal to the department for approval, a description of the proposed approaches and schedule for source modification; and

(b) Comply again with subsection (3) of this section upon completion of source modifications to be considered for source reclassification.

(7) The department may reevaluate a ground water source for direct surface influence, if conditions impacting source classification have changed.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-640, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-640, filed 3/25/93, effective 4/25/93.]

Subpart B - Requirements for Filtered Systems

WAC 246-290-650 Compliance requirements for filtered systems. (1) In addition to the requirements of Parts 1 through 5 of chapter 246-290 WAC, Subpart B of Part 6 of chapter 246-290 WAC applies to purveyors of systems using surface or GWI sources and providing filtration, including:

(a) Systems with water treatment facilities that produced water served to the public before January 1, 1991;

(b) Unfiltered systems installing filtration, once the new water treatment facilities are on-line; and

(c) New systems using surface or GWI sources. For the purpose of the Part 6 chapter 246-290 WAC requirements, new systems are defined as systems first serving water to the public after December 31, 1990.

(2) The purveyor of a new system using a surface or GWI source shall comply with the requirements of Part 6 subparts A and B chapter 246-290 WAC and be subject to the treatment technique violations specified in WAC 246-290-632 beginning when the system first serves water to the public and thereafter.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-650, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-650, filed 3/25/93, effective 4/25/93.]

WAC 246-290-652 Filtration technology and design criteria for existing filtered systems. (1) The purveyor shall treat all surface and GWI sources using one of the following filtration technologies unless another technology is acceptable to the department:

(a) Conventional;

(b) Direct;

(c) Diatomaceous earth; or

(d) Slow sand.

(2) Purveyors not using one of the filtration technologies in subsection (1) of this section or not complying with the design criteria specified in WAC 246-290-676 shall submit a project report to the department that demonstrates to the department's satisfaction that the existing water treatment facility can be operated to reliably produce, by June 29, 1993, water meeting the operating and performance requirements of WAC 246-290-654 and 246-290-660, respectively. The project report shall comply with the requirements of WAC 246-290-110.

(3) The purveyor shall make the demonstration required under subsection (2) of this section using the latest twelve months of operating data, results of special studies conducted to test the performance of the water treatment facility under adverse water quality conditions or other means acceptable to the department.

(4) For water treatment facilities currently unable to meet the performance and operation requirements, the project report shall specify the modifications needed to upgrade the facility. Purveyors upgrading existing water treatment facilities shall comply with the design and reliability requirements under WAC 246-290-676 and 246-290-678, respectively.

(5) The purveyor of a new system using a surface or GWI source shall be subject to the:

(a) Design and reliability requirements under WAC 246-290-676 and 246-290-678, respectively; and

(b) Operating criteria for new water treatment facilities under WAC 246-290-654.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-652, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-652, filed 3/25/93, effective 4/25/93.]

WAC 246-290-654 Treatment criteria for filtered systems. (1) The purveyor shall operate filters such that maximum flow rates do not exceed those specified in Table 10. The purveyor may operate filters at higher flow rates, if the purveyor demonstrates to the department's satisfaction that filtration at the higher rate consistently achieves at least 99 percent (2 log) removal of *Giardia lamblia* cysts (and, if serving at least 10,000 people, 99 percent (2 log) removal of *Cryptosporidium* oocysts) and meets the turbidity performance requirements of Table 11.

Table 10
FILTRATION OPERATION CRITERIA

FILTRATION TECHNOLOGY/MEDIA	MAXIMUM FILTRATION RATE (gpm/ft((3)) (2))
Conventional, Direct and In-Line	
Gravity Filters with Single Media	3
Gravity Filters with Deep Bed, Dual or Mixed Media	6
Pressure Filters with Single Media	2

Pressure Filters with Deep Bed, Dual or Mixed Media	3
Slow Sand	0.1
Diatomaceous Earth	1.0

(2) The purveyor using conventional, direct or in-line filtration shall ensure that effective coagulation is in use at all times the water treatment facility produces water served to the public.

(3) The purveyor using conventional, direct, or in-line filtration shall demonstrate treatment effectiveness for *Giardia lamblia* cyst (and, if serving at least 10,000 people, *Cryptosporidium* oocyst) removal by one of the following methods:

(a) Turbidity reduction method. (The purveyor shall:) ((~~where source and filtered water turbidity measurements are made in accordance with WAC 246-290-664 (2) and (3) respectively:~~

~~(i) When source turbidity is greater than or equal to 2.5 NTU, the purveyor shall achieve the turbidity performance requirements specified in WAC 246-290-660(1); or~~

~~(ii) When source turbidity is less than 2.5 NTU, the purveyor shall achieve~~))

((i) Make source and filtered water turbidity measurements in accordance with WAC 246-290-664(2) and (3), respectively, and shall achieve:)

(A) (At least A)n eighty percent reduction in source turbidity based on an average of the daily turbidity reductions measured in a calendar month; or

(B) An average daily filtered water turbidity less than or equal to 0.1 NTU.

(b)Particle counting method. The purveyor shall:

(i) Use a particle counting protocol acceptable to the department; and

(ii) Demonstrate at a frequency acceptable to the department at least the following log reduction of particles in the size range of five to fifteen microns (*Giardia lamblia* cyst-sized particles) (or three to five microns (*Cryptospridium* oocyst-sized particles),) as applicable:

(A) 2.5 log reduction for systems using conventional filtration; or

(B) 2.0 log reduction for systems using direct or in-line filtration.

(c) Microscopic particulate analysis method. The purveyor shall:

(i) Use a protocol acceptable to the department; and

(ii) Demonstrate at a frequency acceptable to the department at least the following log reduction of *Giardia lamblia* cysts (and *Cryptosporidium* oocysts) and/or *Giardia lamblia* cyst (and *Cryptosporidium* oocyst) surrogate indicators as applicable:

(A) 2.5 log reduction for systems using conventional filtration; and

(B) 2.0 log reduction for systems using direct or in-line filtration.

(d) Other methods acceptable to the department.

(4) The purveyor shall ensure continuous disinfection of all water delivered to the public and shall:

(a) Maintain an adequate supply of disinfection chemicals and keep back-up system components and spare parts on hand;

(b) Develop, maintain, and post at the water treatment facility a plan detailing:

(i) How water delivered to the public will be continuously and adequately disinfected; and

(ii) The elements of an emergency notification plan to be implemented whenever the residual disinfectant concentration at entry to distribution falls below 0.2 mg/L for more than one hour.

(c) Implement such plan during an emergency affecting disinfection.

(5) Operations program.

(a) For each water treatment facility treating a surface or GWI source, the purveyor shall develop an operations program and make it available to the department for review upon request.

(b) The program shall be submitted to the department as an addendum to the purveyor's water system plan (WAC 246-290-100) or small water system management program (WAC 246-290-105).

(c) The program shall detail how the purveyor will produce optimal filtered water quality at all times the water treatment facility produces water to be served to the public.

(d) The purveyor shall operate the water treatment facility in accordance with the operations program.

(e) The operations program shall include, but not be limited to, a description of:

(i) For conventional, direct or in-line filtration, procedures used to determine and maintain optimized coagulation as demonstrated by meeting the requirements of WAC 246-290-654(3);

(ii) Procedures used to determine chemical dose rates;

(iii) How and when each unit process is operated;

(iv) Unit process equipment maintenance program;

(v) Treatment plant performance monitoring program;

(vi) Laboratory procedures;

(vii) Records;

(viii) Reliability features; and

(ix) Response plans for water treatment facility emergencies, including disinfection failure and watershed emergencies.

(f) The purveyor shall ensure the operations program is:

(i) Readily available at the water treatment facility for use by operators and for department inspection;

(ii) Consistent with department guidelines for operations procedures such as those described in department guidance on surface water treatment and water system planning; and

(iii) Updated as needed to reflect current water treatment facility operations.

(6) Pressure filters. Purveyors using pressure filters shall:

(a) Inspect and evaluate the filters, at least every six months, for conditions that would reduce their effectiveness in removing *Giardia lamblia* cysts (or *Cryptosporidium* oocysts);

(b) Maintain, and make available for department review, a written record of pressure filter inspections; and

(c) Be prepared to conduct filter inspections in the presence of a department representative, if requested.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-654, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 94-14-001, § 246-290-654, filed 6/22/94, effective 7/23/94; 93-08-011 (Order 352B), § 246-290-654, filed 3/25/93, effective 4/25/93.]

WAC 246-290-660 Filtration. (1) Turbidity performance requirements.

(a) The purveyor shall ensure that the turbidity level of representative filtered water samples:

(i) Complies with the performance standards in Table 11; and

(i) Never exceeds 5.0 NTU (for any system using slow sand, diatomaceous earth, or for any system serving less than 10,000 people and using conventional, direct, or in-line filtration).

(ii) (Never exceeds 1.0 NTU for any system serving at least 10,000 people and using conventional, direct, or in-line filtration.

(iii) Never exceeds the maximum allowable turbidity determined by the department on a case-by-case basis for any system using an Alternate Filtration Technology approved under WAC 246-290-676(2)(b).)

Table 11

TURBIDITY PERFORMANCE REQUIREMENTS

Filtration Technology	Filtered water turbidity (in NTUs) shall be less than or equal to this value in at least 95% of the measurements made each calendar month	
	(Systems serving < 10,000 people)	(Systems serving > 10,000 people)

Conventional, Direct and In-line	0.50	(0.30)
Slow Sand	1.0	(1.0)
Diatomaceous Earth	1.0	(1.0)
Alternate Technology	(a)s determined by the department (through case-by-case approval of technology, in accordance with 246-290-676.)	

(b) The department may allow the turbidity of filtered water from a system using slow sand filtration to exceed 1.0 NTU, but never 5.0 NTU, if the system demonstrates to the department's satisfaction that the higher turbidity level will not endanger the health of consumers served by the system. As a condition of being allowed to produce filtered water with a turbidity exceeding 1.0 NTU, the purveyor may be required to monitor one or more parameters in addition to the parameters specified under WAC 246-290-664. The department shall notify the purveyor of the type and frequency of monitoring to be conducted.

(2) *Giardia lamblia (, Cryptosporidium,)* and virus removal credit.

(a) The department shall notify the purveyor of the removal credit granted for the system's filtration process. The department shall specify removal credit for:

(i) Existing filtration facilities based on periodic evaluations of performance and operation; and

(ii) New or modified filtration facilities based on results of pilot plant studies or full scale operation.

(b) Conventional, direct, and in-line filtration.

(i) The removal credit the department may grant to a system using conventional, direct, or in-line filtration and demonstrating effective treatment is as follows:

Percent Removal Credit (log)

(Filtration Technology	*Giardia*		Virus		((*Cryptosporidium*))	
	((Percent)	(log)	(Percent)	(log)	(Percent)	(log))
Conventional	99.7	((2.5))	99	((2.0)	(99)	(2.0))
Direct and in-line	99	((2.0))	90	((1.0)	(99)	(2.0))

(ii) A system using conventional, direct, or in-line filtration shall be considered to provide effective treatment, if the purveyor demonstrates to the satisfaction of the department that the system meets the:

(A) Turbidity performance requirements under subsection (1) of this section; and

(B) Operations requirements of WAC 246-290-654.

(iii) The department may grant a higher level of *Giardia lamblia (, Cryptosporidium,)* and virus removal credit than listed under (b)(i) of this subsection, if the purveyor demonstrates to the department's satisfaction that the higher level can be consistently achieved.

(iv) As a condition of maintaining the maximum removal credit, purveyors may be required to periodically monitor one or more parameters not routinely monitored under WAC 246-290-664. The department shall notify the purveyor of the type and frequency of monitoring to be conducted.

(v) The department shall not grant removal credit to a system using conventional, direct, or in-line filtration that:

(A) Fails to meet the minimum turbidity performance requirements under subsection (1) of this section; or

(B) Fails to meet the operating requirements under WAC 246-290-654.

(c) Slow sand filtration.

The department may grant a system using slow sand filtration 99 percent (2 log) *Giardia lamblia* cyst (and *Cryptosporidium* oocyst) removal credit and 99 percent (2 log) virus removal credit, if the

system meets the department design requirements under WAC 246-290-676 and meets the minimum turbidity performance requirements in subsection (1) of this section.

(d) Diatomaceous earth filtration.

The department may grant a system using diatomaceous earth filtration 99 percent (2 log) *Giardia lamblia* cyst (and *Cryptosporidium* oocyst) removal credit and 90 percent (1 log) virus removal credit, if the system meets the department design requirements under WAC 246-290-676 and meets the minimum turbidity performance requirements in subsection (1) of this section.

(e) Alternate filtration technology.

The department shall grant, on a case-by-case basis, *Giardia lamblia* cyst(, *Cryptosporidium* oocyst)and virus removal credit for systems using alternate filtration technology based on results of product testing acceptable to the department.

(f) The purveyor granted no (*Giardia lamblia* cyst removal credit and, if serving at least 10,000 people, no *Cryptosporidium* oocyst) removal credit shall:

(i) Provide treatment in accordance with WAC 246-290-662 (2) (d); and

(ii) Within ninety days of department notification regarding removal credit, submit an action plan to the department for review and approval. The plan shall:

(A) Detail how the purveyor plans to comply with the turbidity performance requirements in subsection (1) of this section and operating requirements of WAC 246-290-654; and

(A) Identify the proposed schedule for implementation.

((iii) Be considered in violation of the Treatment Technique specified in WAC 246-290-632(2)(a)(i) and shall take follow-up action specified in WAC 246-290-634.

(3) Disinfection by-product precursor removal requirements.

(a) Conventional systems using sedimentation shall meet the treatment technique requirements for control of disinfection by-product precursors specified in 40 CFR 141.135.

(i) Applicability of this requirement shall be determined in accordance with 40 CFR 141.135(a).

(ii) Enhanced coagulation shall be provided in accordance with 40 CFR 141.135(b), if applicable.

(iii) Compliance with the treatment technique requirements for control of disinfection by-product precursors shall be determined in accordance with 40 CFR 141.135(c).

(b) For the purposes of compliance with subsection (3)(a) of this section, sedimentation shall be considered applicable when:

(i) Surface overflow rates and other design parameters are in conformance with traditionally accepted industry standards and textbook values, such as those prescribed in nationally accepted standards, including the most recent version of the *Recommended Standards for Water Works, A Committee Report of the Great Lakes – Upper Mississippi River Board of State Public Health and Environmental Managers;* and

(ii) The system has received pathogen removal credit for the sedimentation basin.

(4) Filter Backwash Recycling requirements.

(a) By no later than December 8, 2003, purveyors using conventional, direct, or in-line filtration must **report** to the department, in writing, whether they recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes within the treatment plant.

(i) Purveyors that **do** recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes must also report the following information:

(A) A plant schematic showing the origin of all flows that are recycled (including, but not limited to, spent filter backwash water, thickener supernatant, and liquids from dewatering processes), the hydraulic conveyance (i.e. pipe, open channel) used to transport them, and the location where they are re-introduced back into the treatment plant.

(B) Typical recycle flow in gallons per minute (gpm), the highest observed plant flow experienced in the previous year (gpm), design flow for the treatment plant (gpm), and the approved operating capacity for the plant.

(b) By no later than June 8, 2004, purveyors using conventional, direct, or in-line filtration that recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes within the treatment plant shall:

(i) Return the recycled flow prior to, or concurrent with the location where primary coagulant is introduced into the flow stream.
(ii) By no later than June 8, 2006, complete any capital improvements (physical modifications requiring engineering planning, design, and construction) necessary to meet the requirements of subsection (4)(b)(i) of this section. A project report and construction documents for capital improvements shall be submitted to the department for review and approval, in accordance with WAC 246-290-110 and WAC 246-290-120, respectively.
(iii) On a case-by-case basis, the department may approve an alternate location for the return of recycle flows.)

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-660, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 94-14-001, § 246-290-660, filed 6/22/94, effective 7/23/94; 93-08-011 (Order 352B), § 246-290-660, filed 3/25/93, effective 4/25/93.]

WAC 246-290-662 Disinfection for filtered systems. (1) General requirements.

(a) The purveyor shall provide continuous disinfection to ensure that filtration and disinfection together achieve, at all times the system serves water to the public, at least the following:

(i) 99.9 percent (3 log) inactivation and removal of *Giardia lamblia* cysts; and

(ii) 99.99 percent (4 log) inactivation and/or removal of viruses.

(b) Where sources receive sewage discharges and/or agricultural runoff, purveyors may be required to provide greater levels of removal and inactivation of *Giardia lamblia* cysts and viruses to protect the health of consumers served by the system.

(c) Regardless of the removal credit granted for filtration, purveyors shall, at a minimum, provide continuous disinfection to achieve at least 68 percent (0.5 log) inactivation of *Giardia lamblia* cysts and 99 percent (2 log) inactivation of viruses.

(2) Establishing the level of inactivation.

(a) The department shall establish the level of disinfection (log inactivation) to be provided by the purveyor.

(b) The required level of inactivation shall be based on source quality and expected levels of *Giardia lamblia* cyst and virus removal achieved by the system's filtration process.

(c) Based on periodic reviews, the department may adjust, as necessary, the level of disinfection the purveyor shall provide to protect the health of consumers served by the system.

(d) Systems granted no *Giardia lamblia* cyst removal credit (and, if serving at least 10,000 people, no *Cryptosporidium* oocyst removal credit).

(i) Unless directed otherwise by the department, the purveyor ((~~of a system granted no *Giardia lamblia* cyst removal credit~~)) shall provide interim disinfection:

(A) To ensure compliance with the monthly coliform MCL under WAC 246-290-310;

(B) Achieve at least 99.9 percent (3 log) inactivation of *Giardia lamblia* cysts; and

(C) Maintain a detectable residual disinfectant concentration, or an HPC level less than 500 organisms/ml, within the distribution system in accordance with subsection (6) of this section.

(ii) The purveyor shall comply with the interim disinfection requirements until the system can demonstrate to the department's satisfaction that it complies with the operating requirements and turbidity performance requirements under WAC 246-290-654 and 246-290-660(1), respectively.

(3) Determining the level of inactivation.

(a) Unless the department has approved a reduced CT monitoring schedule for the system, each day the system serves water to the public, the purveyor, using procedures and CT values acceptable to the department such as those presented in department guidance of surface water treatment, shall determine:

(i) CTcalc values using the system's treatment parameters and calculate the total inactivation ratio achieved by disinfection; and

(ii) Whether the system's disinfection process is achieving the minimum levels of inactivation of *Giardia lamblia* cysts and viruses required by the department.

(b) The department may allow a purveyor to determine the level of inactivation using lower CT values than those specified in (a) of this subsection, provided the purveyor demonstrates to the

department's satisfaction that the required levels of inactivation of *Giardia lamblia* cysts and viruses can be achieved.

(4) Determining compliance with the required level of inactivation.

(a) A purveyor shall be considered in compliance with the inactivation requirement when a total inactivation ratio equal to or greater than 1.0 is achieved.

(b) Failure to provide the required level of inactivation on more than one day in any calendar month shall be considered a treatment technique violation.

(5) Residual disinfectant concentration entering the distribution system.

(a) The purveyor shall ensure that all water entering the distribution system contains a residual disinfectant concentration, measured as free or combined chlorine, of at least 0.2 mg/L at all times the system serves water to the public; and

(b) Failure to provide a 0.2 mg/L residual at entry to distribution for more than four hours on any day shall be considered a treatment technique violation.

(6) Residual disinfectant concentration within the distribution system.

(a) The purveyor shall ensure that the residual disinfectant concentration in the distribution system, measured as total chlorine, free chlorine, combined chlorine, or chlorine dioxide, is detectable in at least ninety-five percent of the samples taken each calendar month.

(b) Water in the distribution system with an HPC less than or equal to 500 organisms/ml is considered to have a detectable residual disinfectant concentration (for the purposes of compliance with WAC 246-290-662(6)(a)).

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-662, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 94-14-001, § 246-290-662, filed 6/22/94, effective 7/23/94; 93-08-011 (Order 352B), § 246-290-662, filed 3/25/93, effective 4/25/93.]

WAC 246-290-664 Monitoring for filtered systems. (1) Source coliform monitoring.

(a) The purveyor shall ensure that source water samples of each surface or GWI source are:

(i) Collected before the first point of disinfectant application and before coagulant chemical addition; and

(ii) Analyzed for fecal coliform density in accordance with methods acceptable to the department.

(b) At a minimum, the purveyor shall ensure source samples are collected for fecal coliform analysis at a frequency equal to ten percent of the number of routine coliform samples collected within the distribution system each month under WAC 246-290-300, or once per calendar month, whichever is greater up to a maximum of one sample per day.

(2) Source turbidity monitoring.

(a) The purveyor using conventional, direct, or in-line filtration shall measure source turbidity at least once per day on a representative sample collected before disinfection and coagulant addition.

(b) Grab sampling or continuous turbidity monitoring and recording may be used to meet the requirement specified in (a) of this subsection.

(iv) Purveyors using continuous turbidity monitoring shall record continuous turbidity measurements at equal intervals, at least every four hours, in accordance with a department-approved sampling schedule.

((d) Purveyors using an approved alternate filtration technology may be required to monitor source water turbidity at least once per day on a representative sample as determined by the department.)

(3) Filtered water turbidity monitoring.

(a) The purveyor (using direct, conventional, or in-line filtration) shall:

(i) Continuously monitor turbidity on representative samples from each individual filter unit and ((~~of~~)) (from) the system's combined filter effluent, prior to clearwell storage;

(ii) (For systems serving at least 10,000 people,) Record continuous turbidity measurements (from each individual filter unit) at equal intervals (of)((,)) at least every (fifteen minutes, and for all systems, from the combined filter effluent at equal intervals of at least every) four hours, in accordance with a department-approved sampling schedule; and

(iii) Conduct monitoring in accordance with the analytical techniques under WAC 246-290-638.

(a) (The purveyor using slow sand or diatomaceous earth filtration shall:

(i) Continuously monitor turbidity on representative samples from each individual filter unit and from the system's combined filter effluent, prior to clearwell storage;

(ii) Record continuous turbidity measurements from the combined filter effluent at equal intervals of at least every four hours in accordance with a department-approved sampling schedule; and

(iii) Conduct monitoring in accordance with the analytical techniques under WAC 246-290-638.

(c) Purveyors using an alternate filtration technology approved under WAC 246-290-676 shall provide monitoring in accordance with the technology-specific approval conditions determined by the department.

(d))Purveyors using slow sand filtration or an alternate filtration technology may reduce filtered water turbidity monitoring to one grab sample per day with departmental approval. Reduced turbidity monitoring shall be allowed only where the purveyor demonstrates to the department's satisfaction that a reduction in monitoring will not endanger the health of consumers served by the water system.

(4) Monitoring the level of inactivation and removal.

(a) Each day the system is in operation, the purveyor shall determine the total level of inactivation and removal of *Giardia lamblia* cysts(, viruses, and, if serving at least 10,000 people, *Cryptosporidium* oocysts) ((~~and viruses~~)) achieved.

(b) The purveyor shall determine the total level of inactivation and removal based on:

(i) *Giardia lamblia* cyst(, *Cryptosporidium* oocyst,) and virus removal credit granted by the department for filtration; and

(ii) Level of inactivation of *Giardia lamblia* cysts and viruses achieved through disinfection.

(c) At least once per day, purveyors shall monitor the following to determine the level of inactivation achieved through disinfection:

(i) Temperature of the disinfected water at each residual disinfectant concentration sampling point used for CT calculations; and

(ii) If using chlorine, pH of the disinfected water at each chlorine residual disinfectant concentration sampling point used for CT calculations.

(d) Each day during peak hourly flow (based on historical information), the purveyor shall:

(i) Determine disinfectant contact time, T, to the point at which C is measured; and

(ii) Measure the residual disinfectant concentration, C, of the water at the point for which T is calculated. The C measurement point shall be located before or at the first consumer.

(e) The department may reduce CT monitoring requirements for purveyors that demonstrate to the department's satisfaction that the required levels of inactivation are consistently exceeded. Reduced CT monitoring shall only be allowed where the purveyor demonstrates to the department's satisfaction that a reduction in monitoring will not endanger the health of consumers.

(5) Monitoring the residual disinfectant concentration entering the distribution system.

(a) Systems serving more than thirty-three hundred people per month.

(i) The purveyor shall continuously monitor and record the residual disinfectant concentration of water entering the distribution system and report the lowest value each day.

(ii) If the continuous monitoring equipment fails, the purveyor shall measure the residual disinfectant concentration on grab samples collected at least every four hours at the entry to the distribution system while the equipment is being repaired or replaced. The purveyor shall have continuous monitoring equipment back on-line within five working days following failure.

(b) Systems serving thirty-three hundred or less people per month.

(i) The purveyor shall collect grab samples or use continuous monitoring and recording to measure the residual disinfectant concentration entering the distribution system.

(ii) Purveyors of **community** systems choosing to take grab samples shall collect:

(A) Samples at the following minimum frequencies:

Population Served	Number/day
25 - 500	1
501 - 1,000	2

1,001	-	2,500	3
2,501	-	3,300	4

(B) At least one of the grab samples at peak hourly flow; and

(C) The remaining samples evenly spaced over the time the system is disinfecting water that will be delivered to the public.

(iii) Purveyors of **noncommunity** systems choosing to take grab samples shall collect samples for disinfectant residual concentration entering the distribution system as directed by the department.

(iv) When grab samples are collected and the residual disinfectant concentration at the entry to distribution falls below 0.2 mg/L, purveyors shall collect a grab sample every four hours until the residual disinfectant concentration is 0.2 mg/L or more.

(6) Monitoring residual disinfectant concentrations within the distribution system.

(a) The purveyor shall measure the residual disinfectant concentration at representative points within the distribution system on a daily basis or as otherwise approved by the department.

(b) At a minimum, the purveyor shall measure the residual disinfectant concentration within the distribution system at the same time and location that a routine or repeat coliform sample is collected in accordance with WAC 246-290-300(3) or 246-290-320(2).

(c) The purveyor may measure HPC within the distribution system in lieu of measuring the residual disinfectant concentration in accordance with this subsection.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-664, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 94-14-001, § 246-290-664, filed 6/22/94, effective 7/23/94; 93-08-011 (Order 352B), § 246-290-664, filed 3/25/93, effective 4/25/93.]

WAC 246-290-666 Reporting for filtered systems. (1) The purveyor shall notify the department, as soon as possible, but no later than ((~~the end of the next business day~~)) (twenty-four hours after the exceedance or treatment technique failure is known), when:

(a) A waterborne disease outbreak potentially attributable to the water system occurs;

(b) The turbidity of the combined filter effluent exceeds 5.0 NTU at any time (for any system using slow sand, diatomaceous earth, or for any system serving less than 10,000 people and using conventional, direct, or in-line filtration);

(c) (The turbidity of the combined filter effluent exceeds 1.0 NTU at any time for a system serving at least 10,000 people and using conventional, direct, or in-line filtration;

(d) The turbidity of the combined filter effluent exceeds the maximum specified level for an alternative filtration technology approved by the department;)

((~~c~~)) ((e)) The residual disinfection concentration falls below 0.2 mg/L at the entry point to the distribution system. The purveyor shall also report whether the residual was restored to 0.2 mg/L or more within four hours; or

(((~~d~~))) ((f)) An event occurs that may affect the ability of the water treatment facility to produce drinking water that complies with this chapter including, but not limited to:

(i) Spills of hazardous materials in the watershed; and

(ii) Treatment process failures.

(2) The purveyor shall report results of monitoring conducted in accordance with WAC 246-290-664 to the department. Monthly report forms shall be submitted within ten days after the end of each month the system served water to the public.

(3) The purveyor shall report, at a minimum, all the information requested by the department using a department-approved form or format including:

(a) Water treatment facility operations information;

(a) Turbidity monitoring results((~~.~~)) (, including:

(i) Source monitoring, if required under WAC 246-290-664(2).

(i) Combined filter effluent.) Continuous measurements shall be reported at equal intervals, at least every four hours, in accordance with a department-approved schedule;

(ii) (Individual filter turbidity monitoring results. Systems serving at least 10,000 people and using conventional, direct, or in-line filtration shall report and take follow-up action as prescribed in 40 CFR 141.175(b). Required follow-up action may include development of a filter profile, a filter self-assessment, as described in 40 CFR 141.175(b)(4), or the completion of a comprehensive performance evaluation (CPE).)

(c) Disinfection monitoring information including:

(i) Level of inactivation achieved;

(ii) Residual disinfectant concentrations entering the distribution system; and

(iii) Residual disinfectant concentrations within the distribution system.

(d) Total level of removal and inactivation; and

(e) A summary of water quality complaints received from consumers served by the water system.

(4) A person certified under chapter 246-292 WAC shall complete and sign the monthly report forms required in this section.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-666, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 94-14-001, § 246-290-666, filed 6/22/94, effective 7/23/94; 93-08-011 (Order 352B), § 246-290-666, filed 3/25/93, effective 4/25/93.]

WAC 246-290-668 Watershed control. (1) The purveyor shall, to the extent possible, exercise surveillance over conditions and activities in the watershed affecting source water quality. The purveyor shall develop and implement a department-approved watershed control program.

(2) The purveyor shall ensure that an evaluation of the watershed is completed at least every six years. Watershed evaluations shall be performed such that results of the survey are included in the purveyor's water system plan in accordance with WAC 246-290-100 or small water system management program in accordance with WAC 246-290-105, whichever is applicable.

(3) A professional engineer registered in the state of Washington shall direct the conduct of the watershed evaluation and develop a watershed evaluation report.

(4) The purveyor shall submit the report to the department within sixty days of completion of the watershed evaluation.

(5) The report shall describe the watershed, characterize the watershed hydrology, and discuss the purveyor's watershed control program. The report shall also describe:

(a) Conditions/activities in the watershed that are adversely affecting source water quality;

(b) Changes in the watershed that could adversely affect source water quality that have occurred since the last watershed evaluation;

(c) The monitoring program the purveyor uses to assess the adequacy of watershed protection including an evaluation of sampling results; and

(d) Recommendations for improved watershed control.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-668, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-668, filed 3/25/93, effective 4/25/93.]

Subpart C - Requirements for Systems Installing Filtration Facilities

WAC 246-290-670 Compliance requirements for existing unfiltered systems installing filtration. (1) The purveyor of an existing unfiltered system shall:

(a) Install filtration within eighteen months after department notification; and

(b) Be subject to the interim compliance requirements as determined by the department and in conformance with 40 CFR 141.13 and WAC 246-290-632.

(2) The purveyor under an enforcement action or compliance agreement that is dated prior to the effective date of Part 6 of chapter 246-290 WAC, shall adhere to the compliance schedule for installation of filtration established in the departmental order or bilateral compliance agreement in lieu of the dates specified in subsection (1) of this section.

(3) The purveyor required to install filtration shall submit an action plan and schedule to the department for review and approval. The plan shall:

(a) Be submitted within ninety days of departmental notification; and

(b) Document the purveyor's plan and implementation schedule to comply with one of the following:

(i) Subparts A and B of Part 6 of chapter 246-290 WAC, if continuing to use the surface or GWI source as a permanent source and installing filtration;

(ii) Subparts A and D of Part 6 of chapter 246-290 WAC, if abandoning the surface or GWI source and purchasing completely treated water from a department-approved public water system using surface or GWI water; or

(iii) All other applicable sections of this chapter, if abandoning the surface or GWI source and developing an alternate department-approved ground water source.

(4) Between written departmental notification of the filtration requirement and installation of filtration, the purveyor shall meet:

(a) The interim disinfection requirements under WAC 246-290-672 or as otherwise directed by the department;

(b) The interim monitoring and reporting requirements under WAC 246-290-674; and

(c) All other applicable requirements of this chapter.

(5) The purveyor installing filtration shall ensure that when completed, the final treatment processes, consisting of filtration and disinfection, will comply with the requirements under WAC 246-290-660 and 246-290-662, respectively.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-670, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 94-14-001, § 246-290-670, filed 6/22/94, effective 7/23/94; 93-08-011 (Order 352B), § 246-290-670, filed 3/25/93, effective 4/25/93.]

WAC 246-290-672 Interim treatment requirements. (1) Purveyors of existing unfiltered systems installing filtration shall provide interim disinfection treatment to:

(a) Ensure compliance with the monthly coliform MCL under WAC 246-290-310;

(b) Achieve inactivation levels of *Giardia lamblia* cysts on a daily basis each month the system serves water to the public as directed by the department; and

(c) Maintain a detectable residual disinfectant concentration in the distribution system, measured as total chlorine, free chlorine, or combined chlorine in 95 percent or more of the samples taken each calendar month. Water in the distribution system with an HPC level less than or equal to 500 organisms/ml is considered to have a detectable residual disinfectant concentration (for the purposes of compliance with this subsection).

(2) Failure to provide the required level of inactivation in subsection (1)(b) of this section on more than one day in any calendar month shall be considered a treatment technique violation.

(3) The department may require the purveyor to provide higher levels of treatment than specified in subsection (1)(b) of this section when necessary to protect the health of consumers served by the public water system.

(4) Interim treatment requirements shall be met in accordance with a schedule acceptable to the department.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-672, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-672, filed 3/25/93, effective 4/25/93.]

WAC 246-290-674 Interim monitoring and reporting. (1) Monitoring. Unless directed otherwise by the department, the purveyor of an existing unfiltered system installing filtration shall:

(a) Conduct interim monitoring in accordance with 40 CFR 141.22;

(b) Measure the residual disinfectant concentration within the distribution system at the same time and location that a routine or repeat sample is collected in accordance with WAC 246-290-300(3) or 246-290-320(2); and

(c) Measure residual disinfection concentrations at entry to the distribution system on a daily basis, or as directed by the department.

(2) Reporting.

(a) The purveyor installing filtration shall report to the department as soon as possible, but no later than ((~~the end of the next business day~~)) (twenty-four hours after the exceedance or treatment technique failure is known), when:

(i) A waterborne disease outbreak potentially attributable to the water system occurs;

(ii) The turbidity of water delivered to the public exceeds 5.0 NTU; or

(iii) The interim disinfection requirements under WAC 246-290-672 are not met.

(b) The purveyor shall report results of monitoring to the department. Monthly report forms shall be submitted within ten days after the end of each month the system served water to the public.

(c) The purveyor shall report, at a minimum, all the information requested by the department using a department-approved form or format including:

(i) Water quality information, including results of monitoring in accordance with WAC 246-290-300 and 246-290-320;

(ii) Disinfection monitoring information;

(iii) A summary of water quality complaints received from consumers served by the system.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-674, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-674, filed 3/25/93, effective 4/25/93.]

WAC 246-290-676 Filtration technology and design criteria. (1) General.

(a) The purveyor proposing to construct new water treatment facilities or to make additions to existing water treatment facilities for surface and GWI sources shall ensure that the facilities comply with the treatment, design, and reliability requirements of Part 6 of chapter 246-290 WAC.

(b) The purveyor shall submit an engineering report to the department describing how the treatment facilities will be designed to comply with the requirements specified in Subparts A, B, and C of Part 6 of chapter 246-290 WAC.

(2) Filtration technology.

(a) The purveyor shall select a filtration technology acceptable to the department using criteria such as those outlined in department guidance on surface water treatment. The following filtration technologies are considered acceptable:

(i) Conventional;

(ii) Direct;

(iii) Diatomaceous earth; and

(iv) Slow sand.

(b) In addition to the technologies specified in subsection (1) of this section, alternate filtration technologies may be acceptable, if the purveyor demonstrates to the department's satisfaction all of the following:

(i) Through acceptable third party testing, that system components do not leach or otherwise add substances to the finished water that would violate drinking water standards, or otherwise pose a threat to public health;

(ii) The technology's effectiveness in achieving at least 99 percent (2 log) removal of *Giardia lamblia* cysts or cyst surrogate particles (, and if intended for use in a system serving at least 10,000 people, at least 99 percent (2 log) removal of *Cryptosporidium* oocysts or oocyst surrogate particles). The purveyor shall further demonstrate the technology's removal capability through research conducted:

(A) By a party acceptable to the department; and

(B) In accordance with protocol and standards acceptable to the department.

(iii) Through on-site pilot plant studies or other means, that the filtration technology:

(A) In combination with disinfection treatment consistently achieves 99.9 percent (3 log) removal and inactivation of *Giardia lamblia* cysts and 99.99 percent (4 log) removal and inactivation of viruses; and

(B) Meets the applicable turbidity performance requirements as determined by the department for the specific treatment process being considered, but in no case to exceed 1.0 NTU for the finished water.

(3) Pilot studies.

(a) The purveyor shall ensure pilot studies are conducted for all proposed filtration facilities, except where waived based on engineering justification acceptable to the department.

(b) The purveyor shall obtain department approval for the pilot study plan before the pilot filter is constructed and before the pilot study is undertaken.

(c) The pilot study plan shall identify at a minimum:

(i) Pilot filter design;

(ii) Water quality and operational parameters to be monitored;

(iii) Type of data to be collected, frequency of data collection, and length of pilot study; and

(iv) Pilot plant operator qualifications.

(d) The purveyor shall ensure that the pilot study is:

(i) Conducted to simulate proposed full-scale design conditions;

(ii) Conducted over a time period that will demonstrate the effectiveness and reliability of the proposed treatment system during changes in seasonal and climatic conditions; and

(iii) Designed and operated in accordance with good engineering practices and that ANSI/NSF standards 60 and 61 are considered.

(e) When the pilot study is complete, the purveyor shall submit a project report to the department for approval in accordance with WAC 246-290-110.

(4) Design criteria.

(a) The purveyor shall ensure that water treatment facilities for surface and GWI sources are designed and constructed in accordance with good engineering practices documented in references such as those identified in WAC 246-290-200.

(b) Filtration facilities.

(i) The purveyor shall ensure that all new filtration facilities and improvements to any existing filtration facilities (excluding disinfection) are designed to achieve at least((:
~~(A)~~))) 99 percent (2 log) removal of *Giardia lamblia* cysts((;))(,) and (if serving at least 10,000 people, 99 percent (2 log) removal of *Cryptosporidium* oocysts.; and)

~~(((B) 90 percent (1 log) removal of viruses.~~

~~(ii) The purveyor proposing to use an alternate filtration technology that does not meet the requirements of (b)(i)(B) of this subsection shall demonstrate to the department's satisfaction that the potential for viral contamination of the source is low. The purveyor shall base the demonstration on results of a watershed evaluation acceptable to the department.~~

~~(iii)~~))) ((ii)) The purveyor shall ensure that all new filtration facilities contain provisions for filtering to waste with appropriate measures for backflow prevention.

(c) The purveyor shall ensure that disinfection systems for new filtration facilities or improvements to existing disinfection facilities are designed to meet the requirements of WAC 246-290-662.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-676, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-676, filed 3/25/93, effective 4/25/93.]

WAC 246-290-678 Reliability for filtered systems. (1) The purveyor shall ensure that reliability features are included in all water treatment facilities used to treat surface or GWI sources.

(2) Reliability features shall include but not be limited to:

(a) Alarm devices to provide warning of treatment process failures including coagulation, filtration, and disinfection. Alarm devices shall warn individuals responsible for taking corrective action and/or provide for automatic plant shutdown until corrective action can be taken;

(b) Standby replacement equipment available to assure continuous operation and control of coagulation, clarification, filtration and disinfection processes;

(c) Multiple filter units that provide redundant capacity when filters are out of service for backwash or maintenance, except where waived based on engineering justification acceptable to the department.

(3) The department may accept alternatives to the requirements specified in subsection (2) of this section, if the purveyor demonstrates to the department's satisfaction that the proposed alternative will assure an equal degree of reliability.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-678, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-678, filed 3/25/93, effective 4/25/93.]

Subpart D - Requirements for Other Unfiltered Systems

WAC 246-290-686 Compliance requirements for unfiltered systems. (1) The purveyor using an unfiltered surface or GWI source shall comply with:

(a) Subparts A and D of Part 6 of chapter 246-290 WAC; and

(b) All other applicable sections of this chapter.

(2) The purveyor purchasing water from a system using a surface or GWI source shall comply with:

(a) The applicable requirements of Subpart A of Part 6 of chapter 246-290 WAC;

(b) The disinfection, monitoring and reporting requirements under WAC 246-290-692 (5)(b), 246-290-694 (8)(b) and 246-290-696(4) respectively when purchasing completely treated surface or GWI water; or

(c) The treatment technique, monitoring and reporting requirements as directed by the department when the purveyor is purchasing incompletely treated surface or GWI water.

(3) The purveyor using an unfiltered GWI source shall be subject to the effective dates, compliance requirements, and violations specified in Table 12.

Table 12
COMPLIANCE REQUIREMENTS FOR SYSTEMS USING UNFILTERED GWI SOURCES

REQUIREMENTS BECOME EFFECTIVE	APPLICABLE PART 6 REQUIREMENTS	VIOLATION TYPE	
		Turbidity MCL	Treatment Technique
Six months after GWI determination	Only Analytical, Monitoring and Reporting Requirements (WAC 246-290-638, 246-290-694 and 246-290-696 respectively)	Refer to 40 CFR 141.13 and 141.22	Not in effect yet
Eighteen months after GWI determination	Subparts A and D	No longer in effect	In effect as defined in WAC 246-290-632

(4) Purveyors of **community** systems using surface water sources had the option to remain unfiltered if they demonstrated compliance with the department's criteria to remain unfiltered by December 30, 1991.

(5) A purveyor that served water to the public before January 1, 1991, using a GWI source may have that source remain unfiltered, if, within eighteen months of GWI determination, the purveyor complies with Part 6 of this chapter and, the source water quality and site-specific conditions under WAC 246-290-690 or 246-290-691 as demonstrated through monitoring conducted in accordance with WAC 246-290-694.

(6) The purveyor with sources that are approved to remain unfiltered shall comply with the source water quality and site-specific conditions under WAC 246-290-690 or 246-290-691 as demonstrated through monitoring conducted in accordance with WAC 246-290-694.

(7) The purveyor shall install filtration when the system fails to meet one or more of the source water quality and site-specific conditions under WAC 246-290-690 and 246-290-691, or the department determines that installation of filtration is necessary to protect the health of consumers served by the water system.

(8) The purveyor, in response to a written notification by the department, shall install filtration within eighteen months.

(9) The purveyor may comply with the requirements to install filtration by:

(a) Constructing a water treatment facility that is designed, operated, and maintained in accordance with Subparts A, B, and C of Part 6 of this chapter;

(b) Satisfying the source water quality and site-specific criteria specified in WAC 246-290-691 and constructing treatment facilities that are designed, operated, and maintained to provide a limited alternative to filtration in accordance with WAC 246-290-692; or

(c) Abandoning the surface water or GWI source, and:

(i) Developing an alternate, department-approved ground water source; or

(ii) Purchasing completely treated water from a department-approved public water system.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-686, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 94-14-001, § 246-290-686, filed 6/22/94, effective 7/23/94; 93-08-011 (Order 352B), § 246-290-686, filed 3/25/93, effective 4/25/93.]

WAC 246-290-690 Criteria to remain unfiltered. (1) For a system not using the "limited alternative to filtration" option to remain unfiltered, the purveyor using a surface water or GWI source shall meet the source water quality and site-specific conditions under this section, as demonstrated through monitoring conducted in accordance with WAC 246-290-694.

(2) Source water quality conditions necessary to remain unfiltered.

(a) Coliform limits.

(i) The purveyor shall ensure that representative source water samples taken before the first point of disinfection have a fecal coliform density less than or equal to 20/100 ml in ninety percent or more of all samples taken during the six previous calendar months the system served water to the public. Samples collected on days when source water turbidity exceeds 1.0 NTU shall be included when determining compliance with this requirement.

(ii) The purveyor shall submit a written report to the department if no source fecal coliform data has been submitted for days when source turbidity exceeded 1.0 NTU. The report shall document why sample results are not available and shall be submitted with the routine monitoring reports for the month in which the sample results are not available.

(b) Turbidity limits.

(i) The purveyor shall ensure that the turbidity level in representative source water samples taken before primary disinfection does not exceed 5.0 NTU.

(ii) A system failing to meet the turbidity requirements in (b)(i) of this subsection may remain unfiltered, if:

(A) The purveyor demonstrates to the department's satisfaction that the most recent turbidity event was caused by unusual and unpredictable circumstances; and

(B) Including the most recent turbidity event, there have not been more than:

(I) Two turbidity events in the twelve previous calendar months the system served water to the public; or

(II) Five turbidity events in the one-hundred-twenty previous calendar months the system served water to the public.

(iii) The purveyor of a system experiencing a turbidity event shall submit a written report to the department documenting why the turbidity event(s) occurred. The purveyor shall submit the report with the routine monitoring reports for the month in which the turbidity event(s) occurred.

(iv) The purveyor of a system with alternate, department-approved sources or sufficient treated water storage may avoid a turbidity event by implementing operational adjustments to prevent water with a turbidity exceeding 5.0 NTU from being delivered to consumers.

(v) When an alternate source or treated water storage is used during periods when the turbidity of the surface or GWI source exceeds 5.0 NTU, the purveyor shall not put the surface or GWI source back on-line, until the source water turbidity is 5.0 NTU or less.

(3) Site-specific conditions to remain unfiltered.

(a) Level of inactivation.

(i) The purveyor shall ensure that the *Giardia lamblia* cyst and virus inactivation levels required under WAC 246-290-692(1) are met in at least eleven of the twelve previous calendar months that the system served water to the public.

(ii) A system failing to meet the inactivation requirements during two of the twelve previous calendar months that the system served water to the public may remain unfiltered, if the purveyor demonstrates to the department's satisfaction that at least one of the failures was caused by unusual and unpredictable circumstances.

(iii) To make such a demonstration, the purveyor shall submit to the department a written report documenting the reasons for the failure. The purveyor shall submit the report with the routine monitoring reports for the month in which the failure occurred.

(b) Redundant disinfection components or automatic shut-off.

The purveyor shall ensure that the requirement for redundant disinfection system components or automatic shut-off of water to the distribution system under WAC 246-290-692(3) is met at all times the system serves water to the public.

(c) Disinfectant residual entering the distribution system.

(i) The purveyor shall ensure that the requirement for having a residual entering the distribution system under WAC 246-290-692(4) is met at all times the system serves water to the public.

(ii) A system failing to meet the disinfection requirement under (c)(i) of this subsection may remain unfiltered, if the purveyor demonstrates to the department's satisfaction that the failure was caused by unusual and unpredictable circumstances.

(iii) To make such a demonstration, the purveyor shall submit to the department a written report documenting the reasons for the failure. The purveyor shall submit the report with the routine monitoring reports for the month in which the failure occurred.

(d) Disinfectant residuals within the distribution system.

(i) The purveyor shall ensure that the requirement for maintaining a residual within the distribution system under WAC 246-290-692(5) is met on an ongoing basis.

(ii) A system failing to meet the disinfection requirements under (d)(i) of this subsection may remain unfiltered, if the purveyor demonstrates to the department's satisfaction that the failure was caused by something other than a deficiency in source water treatment.

(iii) To make such a demonstration, the purveyor shall submit to the department a written report documenting the reasons for the failure. The purveyor shall submit the report with the routine monitoring reports for the month in which the failure occurred.

(e) Watershed control.

(i) The purveyor shall develop and implement a department-approved watershed control program.

(ii) The purveyor shall monitor, limit, and control all facilities and activities in the watershed affecting source quality to preclude degradation of the physical, chemical, microbiological (including viral (contamination, and contamination by *Cryptosporidium* oocysts)), and radiological quality of the source. The purveyor shall demonstrate, through ownership and/or written agreements acceptable to the department, control of all human activities that may adversely impact source quality.

(iii) At a minimum, the purveyor's watershed control program shall:

(A) Characterize the watershed hydrology and land ownership;

(B) Identify watershed characteristics and activities that may adversely affect source water quality; and

(C) Monitor the occurrence of activities that may adversely affect source water quality.

(iv) If the department determines significant changes have occurred in the watershed, the purveyor shall submit, within ninety days of notification, an updated watershed control program to the department for review and approval.

(v) The department may require an unfiltered system to conduct additional monitoring to demonstrate the adequacy of the watershed control program.

(vi) A purveyor shall be considered out of compliance when failing to:

(A) Have a department-approved watershed control program;

(B) Implement the watershed control program to the satisfaction of the department; or

(C) Conduct additional monitoring as directed by the department.

(f) On-site inspections.

(i) The department shall conduct on-site inspections to assess watershed control and disinfection treatment.

(ii) The department shall conduct annual inspections unless more frequent inspections are deemed necessary to protect the health of consumers served by the system.

(iii) For a system to remain unfiltered, the on-site inspection shall indicate to the department's satisfaction that the watershed control program and disinfection treatment comply with (e) of this subsection and WAC 246-290-692, respectively.

(iv) The purveyor with unsatisfactory on-site inspection results shall take action as directed by the department in accordance with a department-established schedule.

(g) Waterborne disease outbreak.

(i) To remain unfiltered, a system shall not have been identified by the department as the cause of a waterborne disease outbreak attributable to a failure in treatment of the surface or GWI source.

(ii) The purveyor of a system identified by the department as the cause of a waterborne disease outbreak may remain unfiltered, if the purveyor demonstrates to the department's satisfaction that system facilities and/or operations have been sufficiently modified to prevent another waterborne disease outbreak.

(h) Total coliform MCL.

(i) For a system to remain unfiltered, the purveyor shall ensure that the MCL for total coliform under WAC 246-290-310 is met in at least eleven of the twelve previous calendar months the system served water to the public.

(ii) A system failing to meet the criteria in (i) of this subsection, may remain unfiltered, if the purveyor demonstrates to the department's satisfaction that the total coliform MCL violations were not caused by a deficiency in source water treatment.

(iii) The department shall determine the adequacy of source water treatment based on results of total coliform monitoring at the entry to the distribution system in accordance with WAC 246-290-694(3).

(i) ((~~THM MCL and monitoring.~~)) (Disinfectant residuals MRDL and disinfection by-products MCLs – Monitoring and compliance.)

For a system to remain unfiltered, the purveyor shall comply with the ((~~THM~~)) monitoring and MCL requirements under WAC 246-290-300((~~(7)~~)) and 246-290-310((~~(5) and (6)~~)), respectively.

(j) Laboratory services.

(i) For a system to remain unfiltered, the purveyor shall retain the services of the public health laboratory or another laboratory certified by the department to analyze samples for total and fecal coliform. Laboratory services shall be available on an as needed basis, seven days a week, including holidays. The purveyor shall identify in the annual comprehensive report required under WAC 246-290-696 the certified laboratory providing these services.

(ii) The department may waive this requirement, if the purveyor demonstrates to the department's satisfaction that an alternate, department-approved source is used when the turbidity of the surface or GWI source exceeds 1.0 NTU.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-690, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 93-08-011 (Order 352B), § 246-290-690, filed 3/25/93, effective 4/25/93.]

WAC 246-290-691 Criteria for unfiltered systems with a "limited alternative to filtration" to remain unfiltered. (1) For a system providing a limited alternative to filtration, the purveyor using a surface water or GWI source shall meet the source quality and site-specific conditions under this section.

(2) Source water turbidity requirements.

(a) The purveyor shall ensure that the turbidity level in representative source water samples taken before primary disinfection does not exceed 5.0 NTU.

(b) A system with more than two turbidity events in the twelve previous calendar months the water was served to the public or more than five turbidity events in the one hundred twenty previous calendar months the water was served to the public shall expand the scope of its next annual comprehensive report required under WAC 246-290-696(6) to include:

(i) A description of the events;

(ii) A summary of previous turbidity events;

(iii) A proposed plan of corrective action; and

(iv) A schedule for implementing the action plan.

(3) Site-specific requirements.

(a) Level of inactivation.

(i) The purveyor shall ensure that the removal and/or inactivation levels required under WAC 246-290-630(11) are met in at least eleven of the twelve previous calendar months that the system served water to the public.

(ii) A system failing to meet the inactivation requirements in (a)(i) of this subsection in two or more months of the previous twelve calendar months the system served water to the public shall expand the scope of its annual comprehensive report required under WAC 246-290-696(6) to include:

(A) A description of the failure(s);

(B) A summary of previous inactivation failures;

(C) A proposed plan of corrective action; and

(D) A schedule for implementing the action plan.

(b) Watershed control.

(i) The watershed must not be allowed to be inhabited, except for those designated individuals and for those periods of time each year that would be directly associated with the protection of the watershed.

(ii) The purveyor shall develop and implement a department-approved watershed control program.

(iii) The purveyor shall monitor, limit, and control all facilities and activities in the watershed affecting source quality to preclude degradation of the physical, chemical, microbiological (including viral (contamination, and contamination by *Cryptosporidium* oocysts)), and radiological quality of the source. The purveyor shall demonstrate, through ownership and/or written agreements acceptable to the department, control of all human activities that may adversely impact source quality.

(iv) At a minimum, the purveyor's watershed control program shall:

(A) Characterize the watershed hydrology and land ownership;

(B) Identify watershed characteristics and activities that may adversely affect source water quality; and

(C) Monitor the occurrence of activities that may adversely affect source water quality.

(v) If the department determines significant changes have occurred in the watershed, the purveyor shall submit, within ninety days of notification, an updated watershed control program to the department for review and approval.

(vi) The purveyor may be required to conduct additional monitoring to demonstrate the adequacy of the watershed control program.

(vii) A purveyor shall be considered out of compliance when failing to:

(A) Have a department-approved watershed control program;

(B) Implement the watershed control program to the satisfaction of the department;

(C) Conduct additional monitoring as directed by the department; or

(D) Prevent the human inhabitation of the watershed, except during the periods of time when conducting watershed protection activities as provided in (b)(i) of this subsection.

(c) On-site inspections.

(i) The purveyor shall submit to on-site inspections by the department to assess watershed control and disinfection treatment.

(ii) The purveyor shall submit to annual inspections by the department unless more frequent inspections are deemed necessary to protect the health of consumers served by the system.

(iii) The purveyor with unsatisfactory on-site inspection results shall take action as directed by the department in accordance with a department-established schedule.

(d) Waterborne disease outbreak.

(i) The system shall not be identified by the department as the cause of a waterborne disease outbreak attributable to a failure in treatment of the surface or GWI source.

(ii) A system identified by the department as the cause of a waterborne disease in (d)(i) of this subsection shall expand the scope of its annual comprehensive report required under WAC 246-290-696(6) to include:

(A) A description of the outbreak;

(B) A summary of previous waterborne disease outbreaks attributed to the system;

(C) A proposed plan of corrective action; and

(D) A schedule for implementing the action plan.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-691, filed 3/9/99, effective 4/9/99.]

WAC 246-290-692 Disinfection for unfiltered systems. (1) General requirements.

(a) The purveyor without a limited alternative to filtration shall provide continuous disinfection treatment to ensure at least 99.9 percent (3 log) inactivation of *Giardia lamblia* cysts and 99.99 percent (4 log) inactivation of viruses at all times the system serves water to the public.

(b) The purveyor with a limited alternative to filtration shall meet the treatment requirements in WAC 246-290-630(11) at all times the system serves water to the public.

(c) The purveyor may be required to provide greater levels of inactivation of *Giardia lamblia* cysts, other pathogenic microorganisms of public health concern, and viruses to protect the health of consumers.

(d) Failure to meet the inactivation level requirements of WAC 246-290-690 (3)(a) or 246-290-691 (3)(a) shall be considered a violation.

(2) Determining the level of inactivation.

(a) Each day the system without a limited alternative to filtration serves water to the public, the purveyor, using procedures and $CT_{99.9}$ values specified in 40 CFR 141.74, Vol. 54, No. 124, (published June 29, 1989, and copies of which are available from the department), shall determine:

(i) CT values using the system's treatment parameters and calculate the total inactivation ratio achieved by disinfection; and

(ii) Whether the system's disinfection treatment process is achieving the minimum levels of inactivation of *Giardia lamblia* cysts and viruses required by the department. For purposes of determining compliance with the inactivation requirements specified in subsection (1) of this section, no credit shall be granted for disinfection applied to a source water with a turbidity greater than 5.0 NTU.

(b) Each day the system with a limited alternative to filtration serves water to the public, the purveyor, using appropriate guidance, shall determine:

(i) CT values using the system's treatment parameters and calculate the total inactivation ratio achieved by disinfection; and

(ii) Whether the system's treatment process is achieving the minimum levels of inactivation of *Giardia lamblia* cysts, viruses, or other pathogenic organisms of health concern (including *Cryptosporidium* oocysts) that would be greater than what would be expected from the combination of filtration plus chlorine disinfection.

(c) The purveyor shall be considered in compliance with the daily inactivation requirement when a total inactivation ratio equal to or greater than 1.0 is achieved.

(d) The purveyor of a system using a disinfectant or combination of disinfectants may use CT values lower than those specified in (a) of this subsection, if the purveyor demonstrates to the department's satisfaction that the required levels of inactivation of *Giardia lamblia* cysts, viruses, and, if providing a limited alternative to filtration, any other pathogenic organisms of public health concern (including *Cryptosporidium* oocysts), can be achieved using the lower CT values.

(e) The purveyor of a system using preformed chloramines or adding ammonia to the water before chlorine shall demonstrate to the department's satisfaction that the system achieves at least 99.99 percent (4 log) inactivation of viruses.

(3) The purveyor using either unfiltered or "limited alternative to filtration" treated sources shall ensure that disinfection facilities provide either:

(a) Redundant components, including an auxiliary power supply with automatic start-up and alarm, to ensure continuous disinfection. Redundancy shall ensure that both the minimum inactivation requirements and the requirement for a 0.2 mg/L residual disinfectant concentration at entry to the distribution system are met at all times water is delivered to the distribution system; or

(b) Automatic shut-off of delivery of water to the distribution system when the residual disinfectant concentration in the water is less than 0.2 mg/L. Automatic shut-off shall be allowed only in systems where the purveyor demonstrates to the department's satisfaction that automatic shutoff will not endanger health or interfere with fire protection.

(4) Disinfectant residual entering the distribution system.

(a) The purveyor shall ensure that water entering the distribution system contains a residual disinfectant concentration, measured as free or combined chlorine, of at least 0.2 mg/L at all times the system serves water to the public; and

(b) Failure to provide a 0.2 mg/L residual at entry to distribution for more than four hours on any day shall be considered a treatment technique violation.

(5) Disinfectant residuals within the distribution system.

(a) The purveyor shall ensure that the residual disinfectant concentration in the distribution system, measured as total chlorine, free chlorine, combined chlorine, or chlorine dioxide, is detectable in at least ninety-five percent of the samples taken each calendar month.

(b) The purveyor of a system that purchases completely treated surface or GWI water as determined by the department shall comply with the requirements specified in (a) of this subsection.

(c) Water in the distribution system with an HPC level less than or equal to 500 organisms/ml is considered to have a detectable residual disinfectant concentration.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-692, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 94-14-001, § 246-290-692, filed 6/22/94, effective 7/23/94; 93-08-011 (Order 352B), § 246-290-692, filed 3/25/93, effective 4/25/93.]

WAC 246-290-694 Monitoring for unfiltered systems. (1) Source coliform monitoring for systems without a limited alternative to filtration.

(a) The purveyor shall ensure that source water samples of each surface or GWI source are representative and:

(i) Collected before the first point of disinfectant application; and

(ii) Analyzed for fecal coliform density in accordance with methods acceptable to the department.

(b) The purveyor shall ensure source samples are collected for fecal coliform analysis each week the system serves water to the public based on the following schedule:

Population Served	Minimum Number/week.*
25 - 500	1
501 - 3,300	2
3,301 - 10,000	3
10,001 - 25,000	4
>25,000	5

.*Must be taken on separate days.

(c) Each day the system serves water to the public and the turbidity of the source water exceeds 1.0 NTU, the purveyor shall ensure one representative source water sample is collected before the first point of disinfectant application and analyzed for fecal coliform density. This sample shall count toward the weekly source coliform sampling requirement.

(d) A purveyor shall not be considered in violation of (c) of this subsection, if the purveyor demonstrates to the department's satisfaction that, for valid logistical reasons outside the purveyor's control, the additional fecal coliform sample could not be analyzed within a time frame acceptable to the department.

(2) Source coliform monitoring for systems with a limited alternative to filtration.

(a) The purveyor shall ensure that source water samples of each surface or GWI source are:

(i) Collected before the first point of primary disinfection; and

(ii) Analyzed for fecal coliform density in accordance with methods acceptable to the department.

(b) At a minimum, the purveyor shall ensure source samples are collected for fecal coliform analysis at a frequency equal to ten percent the number of routine coliform samples collected within the distribution system each month under WAC 246-290-300, or once per calendar month, whichever is greater, up to a maximum of one sample per day.

(3) Coliform monitoring at entry to distribution for systems without a limited alternative to filtration.

(a) The purveyor shall collect and have analyzed one coliform sample at the entry point to the distribution system each day that a routine or repeat coliform sample is collected within the distribution system under WAC 246-290-300(3) or 246-290-320(2), respectively.

(b) The purveyor shall use the results of the coliform monitoring at entry to distribution along with inactivation ratio monitoring results to demonstrate the adequacy of source treatment.

(4) Source turbidity monitoring for systems without a limited alternative to filtration.

(a) The purveyor shall continuously monitor and record turbidity:

(i) On representative source water samples before the first point of primary disinfectant application; and

(ii) In accordance with the analytical techniques under WAC 246-290-638.

(b) If source water turbidity is not the same as the turbidity of water delivered to consumers, the purveyor shall continuously monitor and record turbidity of water delivered.

(5) Source turbidity monitoring for systems with a limited alternative to filtration. The purveyor shall:

(a) Continuously monitor turbidity on representative source samples before the first point of primary disinfection application;

(b) Record continuous turbidity measurements at equal intervals, of at least four hours, in accordance with a department-approved sampling schedule; and

(c) Conduct monitoring in accordance with the analytical techniques under WAC 246-290-638.

(6) Monitoring the level of inactivation.

(a) Each day the system is in operation, the purveyor shall determine the total level of inactivation of *Giardia lamblia* cysts, viruses, and, if providing a limited alternative to filtration, any other pathogenic organisms of health concern (including *Cryptosporidium* oocysts), achieved through disinfection.

(b) At least once per day, the purveyor shall monitor the following parameters to determine the total inactivation ratio achieved through disinfection:

(i) Temperature of the disinfected water at each residual disinfectant concentration sampling point used for CT calculations; and

(ii) If using chlorine, pH of the disinfected water at each chlorine residual disinfectant concentration sampling point used for CT calculations.

(c) Each day during peak hourly flow, the purveyor shall:

(i) Determine disinfectant contact time, T, to the point at which C is measured; and

(ii) Measure the residual disinfectant concentration, C, of the water at the point for which T is calculated. The C measurement point must be before or at the first consumer.

(7) Monitoring the residual disinfectant concentration entering the distribution system for either unfiltered systems, or systems using a limited alternative to filtration.

(a) Systems serving more than thirty-three hundred people.

(i) The purveyor shall continuously monitor and record the residual disinfectant concentration of water entering the distribution system and report the lowest value each day.

(ii) If the continuous monitoring equipment fails, the purveyor shall measure the residual disinfectant concentration on grab samples collected at least every four hours at the entry to the distribution system while the equipment is being repaired or replaced. The purveyor shall have continuous monitoring equipment back on-line within five working days following failure.

(b) Systems serving thirty-three hundred or less people.

(i) The purveyor shall collect grab samples or use continuous monitoring and recording to measure the residual disinfectant concentration entering the distribution system.

(ii) A purveyor choosing to take grab samples shall collect:

(A) Samples at the following minimum frequencies:

Population Served	Number/day
25 - 500	1
501 - 1,000	2
1,001 - 2,500	3
2,501 - 3,300	4

(B) At least one of the grab samples at peak hourly flow based on historical flows for the system; and

(C) The remaining sample or samples at intervals evenly spaced over the time the system is disinfecting water that will be delivered to the public.

(iii) When grab samples are collected and the residual disinfectant concentration at the entry to distribution falls below 0.2 , the purveyor shall collect a grab sample every four hours until the residual disinfectant concentration is 0.2 mg/L or more.

(8) Monitoring residual disinfectant concentration within the distribution system for either unfiltration systems, or systems using a limited alternative to filtration.

(a) The purveyor shall measure the residual disinfectant concentration within the distribution system at the same time and location that a routine or repeat coliform sample is collected in accordance with WAC 246-290-300(3) or 246-290-320(2) or once per day, whichever is greater.

(b) The purveyor of a system that purchases completely treated surface or GWI water as determined by the department shall comply with the requirements of (a) of this subsection or as otherwise directed by the department under WAC 246-290-300 (2)(c). At a minimum, the purveyor shall measure the residual disinfectant concentration within the distribution system at the same time and location that a routine or repeat coliform sample is collected in accordance with WAC 246-290-300(3) or 246-290-320(2).

(c) The purveyor may measure HPC within the distribution system in lieu of measuring the residual disinfectant concentration in accordance with this subsection.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-694, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 94-14-001, § 246-290-694, filed 6/22/94, effective 7/23/94; 93-08-011 (Order 352B), § 246-290-694, filed 3/25/93, effective 4/25/93.]

WAC 246-290-696 Reporting for unfiltered systems. (1) The purveyor shall report to the department as soon as possible, but no later than ((~~the end of the next business day~~)) (twenty-four hours after the exceedance or treatment technique failure is known), when:

(a) A waterborne disease outbreak potentially attributable to the water system occurs;

(b) The turbidity of water delivered to the public exceeds 5.0 NTU;

(c) The minimum level of inactivation required by the department is not met;

(d) The residual disinfectant concentration falls below 0.2 mg/L at the entry point to the distribution system. The purveyor shall also report whether the residual was restored to 0.2 mg/L or more within four hours; or

(e) The surface or GWI source is taken off-line due to an emergency.

(2) The purveyor shall report results of monitoring conducted in accordance with WAC 246-290-694 to the department. Monthly report forms shall be submitted within ten days after the end of each month the system served water to the public.

(3) The purveyor shall report, at a minimum, all the information requested by the department using a department-approved form or format including:

(a) Water quality information, including the results of both:

(i) Source coliform monitoring; and

(ii) Source turbidity monitoring.

(b) Disinfection monitoring information, including:

(i) Level of inactivation achieved;

(ii) Residual disinfectant concentrations entering the distribution system; and

(iii) Residual disinfectant concentrations within the distribution system.

(c) A summary of water quality complaints received from consumers served by the water system.

(4) The purveyor of a system that purchases completely treated water shall:

(a) Report results of distribution system residual disinfectant concentration monitoring to the department using department-approved forms or format; and

(b) Submit forms to the department in accordance with subsection (2) of this section or as otherwise directed by the department.

(5) A person certified under chapter 246-292 WAC shall complete and sign the monthly report forms required in this section.

(6) Beginning in 1992, by October 10th of each year, the purveyor shall submit to the department an annual comprehensive report that summarizes the:

(a) Effectiveness of the watershed control program and identifies, at a minimum, the following:

(i) Activities in the watershed that are adversely affecting source water quality;

(ii) Changes in the watershed that have occurred within the previous year that could adversely affect source water quality;

(iii) Activities expected to occur in the watershed in the future and how the activities will be monitored and controlled;

(iv) The monitoring program the purveyor uses to assess the adequacy of watershed protection including an evaluation of sampling results; and

(v) Special concerns about the watershed and how the concerns are being addressed;

(b) System's compliance with the criteria to remain unfiltered under WAC 246-290-690, or, when applicable, the criteria required if the system provides a limited alternative to filtration under WAC 246-290-691; and

(c) Significant changes in system design and/or operation that have occurred within the previous year that impact the ability of the system to comply with the criteria to remain unfiltered, or, if applicable, the ability of the system to provide a limited alternative to filtration in accordance with WAC 246-290-692.

(7) The purveyor of a system attempting to remain unfiltered or to remain with a limited alternative to filtration shall submit a *Filtration Decision Report* at the request of the department. The report shall:

(a) Provide the information by which the department may determine whether a system continues to meet the criteria to remain unfiltered or, if applicable, the criteria allowing the provision of a limited alternative to filtration; and

(b) Be submitted on a schedule as specified by the department.

[Statutory Authority: RCW 43.02.050. 99-07-021, § 246-290-696, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. 94-14-001, § 246-290-696, filed 6/22/94, effective 7/23/94; 93-08-011 (Order 352B), § 246-290-696, filed 3/25/93, effective 4/25/93.]